

Improve Business Performance and Peace of Mind through Abnormal Situation Management



The inability of the control system and plant operations personnel to control incidents has an economic impact of at least \$20 billion annually on the U.S. petrochemical industry alone. The Experion platform integrates products and services designed for abnormal situation management[®] (ASM) that help prevent, detect and mitigate factors that cause plant or mill disturbances.

What are Abnormal Situations?

An abnormal situation occurs when the automation system cannot correct a process disturbance, and operator intervention is required. Major plant incidents now represent the single most significant risk to plant profitability and can result in:

- Lengthy outages and lost production
- Wasted energy and raw materials
- Environmental emissions and fines
- Equipment damage and failure
- Personal injury and loss or endangerment of human life

The ARC Advisory Group estimates that while an advanced process control investment can typically increase production by 3 percent, the same investment made in ASM would increase production by 5 percent. ASM products and services represent the biggest opportunity for increasing profitability.

Three primary causes of incidents are equipment failure, process failure and human error. Each of these incidents has many possible root causes. For example, equipment failure can be due to corrosion, power excursions, worn moving parts, vehicle impact or sabotage following a security breach. Regardless of the root cause, using Honeywell products and services with built-in ASM knowledge prevents and manages the resulting incident. Many smaller incidents that cause process deviations go unreported, yet their accumulated financial effect every year is dramatic.

ASM Technology Reduces Plant Incidents

The ASM Joint Research and Development Consortium is a Honeywell-led research and development consortium of 11 companies and universities. The ASM Consortium was informally established in 1992 as an outgrowth of an effort to define improvements to current Distributed Control System (DCS) alarm system technologies. Realizing that the alarm system was a part of the larger issue of the management of unexpected process upsets, several companies teamed with Honeywell to develop a problem statement and a vision. Extensive research was done at members' operational sites, laying the groundwork for today's ASM approach.

The ASM Consortium's mission is to prevent, detect and mitigate abnormal situations. ASM Consortium research is uniquely incorporated into Honeywell control systems, including the Experion[®] Process Knowledge System (PKS) and TPS, as well as Honeywell product and service solutions for plant asset effectiveness and operator performance. These solutions extend the benefits achieved through improved process control and optimization by reducing unplanned outages and increasing plant uptime and profitability.

Honeywell solutions designed for ASM provide decision-support tools that help mitigate the results of disturbances to the production process caused by equipment failure, process failure and human error.

ASM Benefits

- Improve process uptime
- Reduce plant lifecycle costs
- Reduce asset degradation
- Improve alarm system management
- Ensure safe and profitable production
- Provide personnel and environmental safety
- Ensure regulatory compliance
- Prevent many incidents before they start
- Detect faults early in critical assets
- Increase people effectiveness
- Increase asset availability
- Gain quick access to all control system assets

Reduce Maintenance Costs

Honeywell's broad, process-centric approach to asset management efficiently drives knowledge about the condition of plant assets and impact to operations where and when knowledge is needed. Narrow instrument-centric solutions provide information related to device replacement or maintenance only. Honeywell's more comprehensive approach correlates information from many sources to detect abnormal situations, facilitate workflow collaboration, automate work processes, help people make smart decisions and avoid incidents. The result is overall automation system effectiveness, optimal production and improved profitability throughout the business enterprise.

Reduce Incidents Up to 40 Percent

Honeywell's people effectiveness products and solutions are designed to protect plant profitability and safety through prevention, early detection and mitigation of abnormal situations.

Incident prevention applications, such as Alarm Configuration Manager, help operators avoid errors, while mitigation applications such as Experion ProTrend and Operations Management Pro, help to more quickly mitigate a plant incident. Providing people with decision-support and diagnostic tools can reduce the impact of incidents or stop them. ASM studies reveal that 25 percent of plant incidents are attributable to or exacerbated by people receiving incorrect, missing or confusing information. Applying ASM guidelines increases awareness,

decision-making abilities and responsiveness, reducing abnormal situations by as much as 40 percent.

Reduce Process Upsets

According to the ASM Consortium, a well-engineered alarm system is critical to minimizing the impact and number of incidents that can occur in a plant or mill. An effective alarm management strategy protects uptime and safety of production operations by enhancing the ability of people to detect process faults and implement corrective actions at an early stage.

Honeywell's alarm and event analysis software and services reduce potential losses from process upsets caused or worsened by excessive alarms, assist in assessing the workload of people due to alarms and reduce effort to manage the alarm system consistent with best practices. Honeywell's alarm and event management services provide advanced solutions that allow the alarm system to be engineered and maintained to meet your site's alarm management policies and industry-recommended practices.

Early Event Detection Improves Response Time

Many events are not detected prior to alarms, which significantly reduces available response time as well as performance. The ASM Consortium has researched solutions to this problem and successfully applied multivariable state analysis (MVSA) technology to improve response to events that result in lost production, sometimes detecting the precursors to a potential abnormal situation several hours before the operator would have received an alarm. This technology provides alerts to individual problem areas, and combined with plant operating data, helps determine probable causes and recommended actions for sustaining and expanding actual asset performance. Honeywell offers several early event detection solutions for a wide range of situations.

Experion Integrates Alarms and Events

An alarm and event management subsystem integrated with the Experion platform fully embraces the flexible OPC alarm and event standard. Only Honeywell offers operational integration of alarms and events from its installed base into Experion.

Advanced applications, third-party alarms and events, messages, sequence of events, as well as common journaling for events from all sources are all seamlessly presented to the operator in a single display. Flexible fields from third-party sources may be logically mapped into desired columns within the alarm and event

summaries. This allows simple access to key data without overcomplicating presentation to the operator, and is fully supported in the SQL Server-based advanced journaling subsystem.

Advanced Solutions Designed for ASM

Shadow Plant Simulation Improves Plant Availability

Honeywell's Shadow Plant[®] application, which provides dynamic plant simulation, is the most valuable tool available for assessing and improving a plant's ability to achieve faster, incident-free startups, better implementation of advanced control, less scrap and off-spec material, identification of design flaws prior to startup, and more effective operator training.



Mobile PKS Wireless Solution

Honeywell's Mobile PKS suite of wireless productivity solutions enables engineering, operations and maintenance personnel to capture process data directly from the Experion platform and field devices, and all view the same data. Benefits include increased frequency, timeliness and reliability of field data, consistent information gathering across shifts, increased awareness of equipment conditions, improved communication across plant roles and functions, and improved commissioning and preventive maintenance prioritization.

Asset Manager Efficiently Monitors Plant Assets

Honeywell's Asset Manager[™] elevates asset management to the process-centric level by providing knowledge about the status, events and operating conditions of all plant processes, and assets and field-connected devices. Asset Manager, integrated

For More Information

To learn more about how Honeywell's Abnormal Situation Management solutions, visit www.honeywell.com/ps or contact your Honeywell account manager.

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with Experion, troubleshoots and maintains the Experion system, control loops and field device assets, as well as traditional process-based assets. It can correlate data from different sources in a way that field-centric approaches cannot.

Loop Management Service

Honeywell's Loop Management Service and Loop Scout[®] allow adoption of a Reliability-Centered Maintenance (RCM) approach to loop management by bringing together control engineers and maintenance technicians. This model allows plant personnel to resolve the worst performing loop problems with the highest business impact.

Profit Suite for Plant-Wide Control and Optimization

Honeywell's Profit[®] Suite is a family of Advanced Process Control and optimization products that allow management of all aspects of advanced control and optimization, from improving regulatory loop control to globally optimizing the entire process plant. As a unified family of solutions, Profit Suite applications can be selected and combined to achieve optimal combinations of process optimization and improve return on investment. Projects employing these applications typically have payback times measured in months, making them among the most economically attractive plant investments available. Profit Suite applications also reduce maintenance costs and increase reliability by reducing valve wear.

ASM Consortium Membership Offers Unique Benefits

The ASM Consortium accepts new companies in membership categories that include users, associates and universities. The user category comprises process industry manufacturing or operating companies. Associate companies may provide unique knowledge and capabilities to assist in the development of ASM-related solutions not available within Honeywell or other member companies. Universities conducting ASM-related research are eligible to become university members.